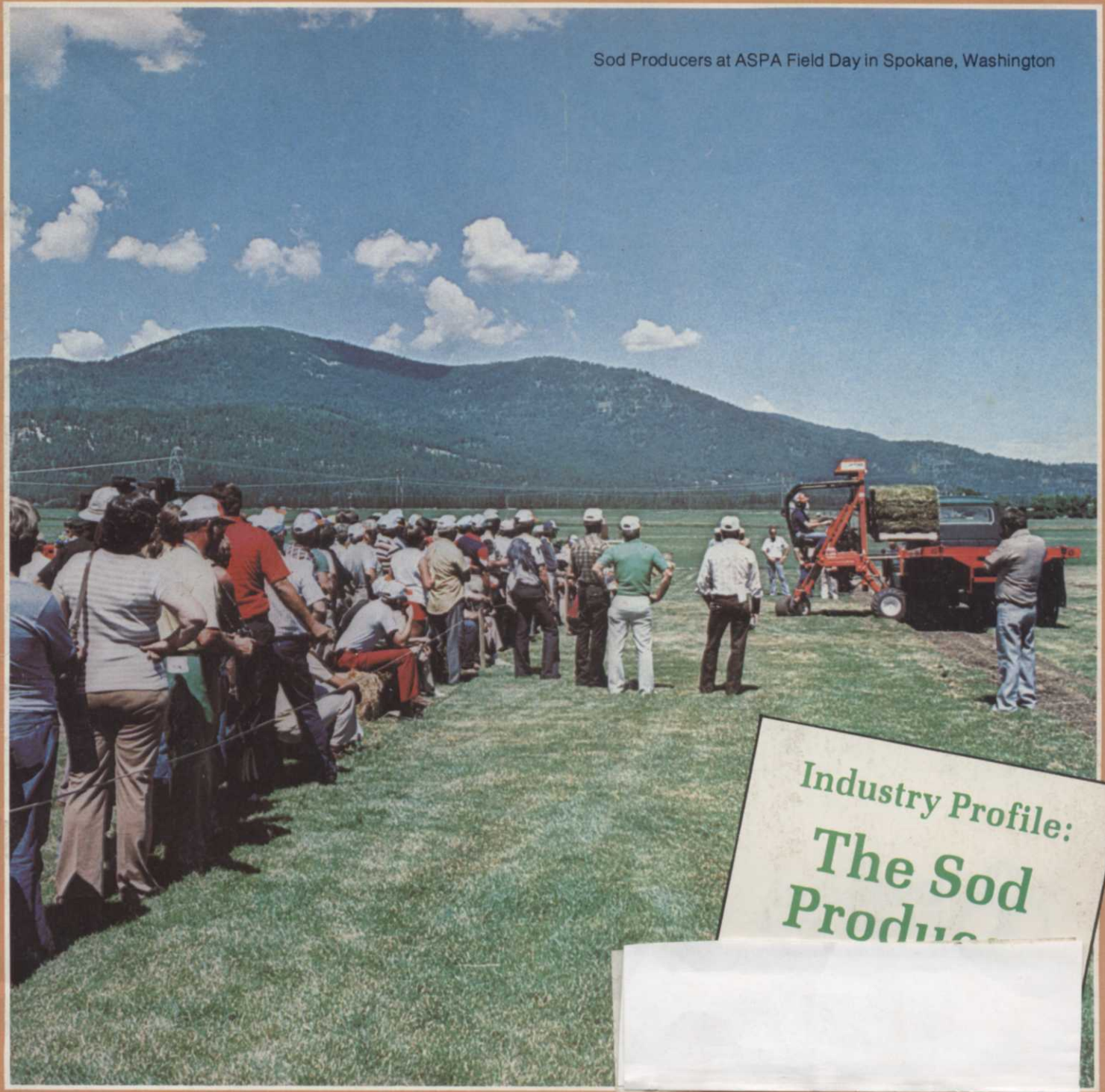
The Business Journal of Vegetation Management August 1978/$1.25

WEEDS TREES & TURF

Choices in Tree Fertilization

Maryland Sod Production: Ten Years Later

Summer Convention Roundup



Sod Producers at ASPA Field Day in Spokane, Washington

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Single copy price $1.25 for current and back issues. Foreign $1.50. Subscription in the U.S. and Canada are $12.00 per year. $15.00 in other countries. Foriegn air mail optional at an addtional $24 per year. Controlled circulation postage paid at Cleveland, Ohio 44101. Postmaster: send form 3569.

Member, American Business Press, Business Publications Audit, National Golf Foundation. American Sod Producers Association, National Landscape Association.

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GREEN INDUSTRY NEWS

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VIEWPOINT

Bruce F. Shank, Editor

You might think that someone who gets excited about grass seed must be strange. But if you visit the research facilities of seed companies across the United States and Europe, you would feel interested too.

In the past two months I've had the pleasure of visiting seed companies from New Jersey to Post Falls, Idaho. And much to my surprise, I'm excited about varieties ready to enter the market in the next two years.

The greatest swell of research interest is for reclamation. Northrup King, Jacklin, Lofts, International and Stanford all have products ready to serve this blossoming field. They also are studying new varieties tolerant of alkaline and acid soils for western needs.

And before you get used to bluegrasses just released, improved ryegrasses and fine fescues will be available which either add significantly to mixes or stand on their own.

You should visit a seed research farm and talk to a research director. They somehow manage to memorize what grass is located in every three by five foot block of a five-acre field. Then you go to their offices and see stacks of paper bags filled with seed. Each bag has a long number on it and someone knows what each number stands for. In fact, by looking at a few seeds that researcher can tell you the genus.

It used to be that many of the grasses were discovered on a golf course or park where they developed through natural selection. Today, most of the grasses are developed through cloning at research farms. Not only must the grass be disease resistant, but it will never make it to market unless it also produces abundant seed.

Once the new variety is developed, years of testing in many locations across the country are needed before commercial introduction. There are currently a number of varieties in this phase right now. Within the next two or three years there will be a number of new names in turf seed, including a new Merion.

We need to improve our methods of informing the public about new, improved turfgrass varieties. Urban extension agents and retail nurserymen must be kept abreast of turfgrass research. Buyers for discount stores need to know the facts of fine turf seed.

It is your responsibility to advise customers of improved varieties. It is also your responsibility to ask sod producers to grow the new varieties. As a result, customers will receive the best turf available and you will be respected for your up-to-date knowledge of your field.

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GREEN INDUSTRY NEWS

NURSERY

AAN holds one of largest meetings yet

Carlson Dyas Howard Wild

Dr. Robert Carlson, Michigan State University, received the Norman Jay Colman Award. Robert Dyas, Iowa State University, was presented the L. C. Chadwick Educator's Award. Howard Van Smith, Florida journalist, was the 1978 recipient of the Garden Communicator's Award. Dale Wild, Dale Wild Sarcoxie Nurseries, was inducted into the AAN's Hall of Fame.

The 103rd Annual Convention and Trade Show of the American Association of Nurserymen, held mid-July in New Orleans, was one of the largest in the association's history. More than 1200 nurserymen and landscapers attended the five-day meeting and viewed 93 nursery exhibits.

The meeting was held in conjunction with nine other association meetings, including the All-America Rose Selections (AARS), American Nurserymen's Protective Association (ANPA), Garden Centers of America (GCA), Horticultural Research Institute (HRI), Mailorder Association of Nurserymen (MAN), Nursery Association Executives (NAE), National Association of Plant Patent Owners (NAPPO), National Landscape Association (NLA), and the Wholesale Nursery Growers of America (WNGA).

General education sessions were held every day and many topics important to nurserymen were discussed. Several important facts on transporting nursery stock were presented by James Morgans. Trying to save on packing before shipment can be more costly in the long run. The best containers are sturdy wooden crates. All excess water should be drained to hold down weight and bare root material should be packed in a water-absorbing medium. Shipment by "pool trucks", pooling several orders and getting a trailer load rate, was introduced as the most practical and economical way of shipping nursery stock.

Plant conditioning, or "acclimatization", can prepare a foliage plant for life indoors, upping its chances of survival. Recent research, according to Charles Conover of the University of Florida, has shown that the degree of plant conditioning is more important than the amount of stored carbohydrates when a plant is moved into an indoor environment. It takes approximately 4-8 weeks for the chloroplasts and grana of a plant leaf to orientate to a lower light intensity.

Dr. Charles Krause, plant pathologist at the USDA laboratory in Delaware, Ohio, explained the possibilities of the scanning electron microscope in "plant fingerprinting". Dr. Krause presented several unique slides in "a view of plants seldom seen".

Other topics on the educational program included developing a good foreman and attracting, training and keeping personnel. Eric McCarty, Management Concepts, Inc., Dayton, Ohio, presented both topics.

The AAN serves over 2700 member firms involved in nursery business. Its "Green Survival Program" encourages citizen action for environmental enhancement by saying that any one person can take many small steps to protect and improve the quality of life in our land.

SOD

ASPA meeting keys on seed production

Nearly a fifth of the sod producers in the United States traveled to Spokane, WA, in July to witness turf seed production and to learn the latest technology at the annual American Sod Producers's Association convention and field days.

A unique irrigation system displayed at the meeting, called Agri-Pop, is placed 18 or more inches below the surface. Special spray heads work their way up through the soil for sprinkling and then retract into the ground when turned off. The manufacturer says the system permits tillage and other surface disturbance without damage to a sprinkler system.

Doyle Jacklin of Jacklin Seed Co. chaired the convention and hosted a tour of the Jacklin turfgrass fields and new processing plant. Since the Northwest is seed country, the sod producers were able to see where improved varieties were developed and grown. Every major turf seed company exhibited at the show as well.

Delegates were treated to a salmon bake, skydiving exhibition, and a stunt flying show. Next year's ASPA field days are set for Columbus, OH. The winter meeting will be held in Scottsdale, AZ, in February.

GOVERNMENT UPDATE

EPA returns generic name proposals

The Environmental Protection Agency has returned approximately 1000 forms submitted by industries proposing generic names which the firms wished to declare confidential. In rejecting the forms, the EPA admits that the generic name criteria document was late and that many forms had been submitted before it was available. However, EPA maintains, industry could have made a much better initial effort on its own to provide names which represented a balance between legitimate confidentiality and serving the public interest by identifying basic structure.

ACSH forms to counter "cancerphobia"

The American Council on Science and Health is a newly formed "association of concerned scientists who are alarmed that chemical and cancerphobia has damaged this country and unless arrested will damage it even more," according to Executive Director Dr. Elizabeth M. Whelan. Whelan stated that the council will provide information"based on the classic scientific method, following the standard guideline which compares benefit and risk"

The council will issue position papers, consisting of a detailed technical report prepared for the scientific community and a summary report written for a more general audience. One of the first papers, to be issued this fall, will deal with cancer in New Jersey.

Landscape Contractor News

NLA announces landscape award winners

The National Landscape Association has announced the winners of their Eighth Annual Residential Landscape Award Program. Entries were judged on the basis of excellence, as well as practicality of design, selection of plants and materials, execution of the installation, and maintenance of the project.

Awards were presented for single family residences: designed and installed in Atlanta, GA, by Green Brothers Landscape Company, Smyra, GA; designed and installed in Wilmington, DE, by J. Franklin Styer Nurseries, Concordville, PA; designed by John N. Vogley, Oakland, CA, and installed in Orinda, CA, by T. M. T. Company, Lafayette, CA; designed by Wirth Associates, Billings, MT, and installed in Cody, WY, by Matz Landscaping, Billings, MT.

Awards for active use area for family residence included: two awards for residences in Freeport and Atlantic Beach, NY, designed and installed by Atlantic Nursery, Garden Shop and Landscape Company, Freeport, NY; and an award to a design and installation in Lafayette, IN, by Frits Loonsten, Indianapolis, IN.

An award for passive use area of single family residence was presented for design and installation in Manhassett, NY, by Atlantic Nursery, Garden Shop & Landscape Co., Manhassett, NY.

AQUATIC

APMS fights weeds on international level

Speakers from 16 states and four foreign countries provided over 60 topics for 306 registrants at the Aquatic Plant Management Society's 18th annual meeting in Orlando, Florida in July. Officials from the United States Army Corps of Engineers (USACE), Environmental Protection Agency (EPA), Tennessee Valley Authority (TVA), Chemical Companies, British Columbia Ministry of the Environment, University of Khartoum in Sudan, Australia, the Instituto De Investigaciones Sobre Recursos Bioticos in Mexico, and the Panama Canal Zone presented their battle plans in the war against aquatic weeds.

The white amur is now allowed in Florida waters. However, it is being restricted to private, landlocked lakes of 25 acres or less. Out of 125 requests for use of the white amur, 21 have been turned down, and only four accepted so far.

Another fish that promises biological control is the *Tilapia zillii*. Tilapia are native to Africa and the Middle East and have been introduced in California and Arizona in substantial numbers. It is sold in California grocery stores as "nile perch"

New officers were elected at the meeting. The new president is Julian J. Raynes, United States Army Corps of Engineers, Atlanta, Georgia. He took over the gavel from Donald V. Lee, Louisiana Wildlife and Fisheries, Baton Rouge.

William N. Rushing, USACE, Vicksburg, Mississippi, is the new president-elect. Al Burkhalter, Florida Department of Natural Resources, took over as treasurer. Two new directors were also elected: Leon Bates, TVA, and Max McCowen, Lilly Research Laboratories, Greenfield, Indiana.

Bill Haller took over responsibilities as editor of the society's journal. Anyone wishing a paper published should contact him in the Department of Agronomy, University of Florida, Gainesville, 32611.

The 1979 meeting will be held at the Chattanooga Choo-Choo, in Chattanooga, Tennessee, July 15-18.

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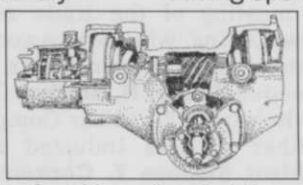

Gravely's famous all-gear direct drive. A transmission with a lot of teeth in it

The Gravely swiftamatic 4-speed transmission is a good example. Through years of performance, it delivers the precise speeds and power you need to do a lot of jobs a lot easier. And a lot better.

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PEOPLE

The new officers and directors of the All-America Rose Selections, pictured above, were elected during their annual meeting held in conjunction with the 103rd Annual Convention and Trade Show of the American Association of Nurserymen in New Orleans in July.

Seated, left to right, are: **Fred Edmunds,** Roses by Fred Edmunds, Oregon, vice-president; **Larry Sjulin,** Inter-State Nurseries, Iowa, president; and **George Rose,** Iowa, secretary. Standing, left to right, are: Directors **Joe Burks,** Co-Operative Rose Growers, Texas; **Ollie Weeks,** Weeks Wholesale Rose Growers, California; **S. B. Hutton, Jr.,** The Conard-Pyle Company, Pennsylvania; **Dave Stump,** Jackson & Perkins, Oregon; and **Sam Welsh,** Mt. Arbor Nurseries, Iowa.

New officers and directors of the American Association were also elected during their annual meeting in New Orleans. Pictured above seated, left to right are: Treasurer **Henry A. Weller,** Congdon & Weller Nurseries, New York; President **Ernest A. Tosovsky,** Home Nursery Greenhouses, Illinois; Vice-President and Director, Region IV, **Hugh Steavenson,** Forrest Keeling Nursery, Missouri. Standing, left to right, are: Director, Region V, **Kent Langlinais,** Kent's Nursery, Louisians; Director, Region VI, **Jerry Rosso,** J. Rosso Wholesale Nurseries, Washington; Director-at-Large **Itsuo Uenaka,** Cupertino Nursery, California; Director, Region II, **John Wight, Jr.,** Wight Nurseries, Georgia; and Director, Region III, **David Farley,** Farley Brothers Nursery, Michigan.

Edward J. Duling of Lakeside, California, was installed 1978-79 president of the 900 member Southern California Turfgrass Council during a July meeting of the trade association in Commerce. Duling, who owns a commercial landscape maintenance firm operating in the San Diego area, succeeded **Sydney H. Gordon.** Gordon is associated with Robinson Fertilizer Company in Orange.

Other officers inducted included 1st Vice-President **Stephen T. Cockerham,** Rancho Verde Turf Farms, Perris; 2nd Vice-President **John F. Culbertson,** Pacific Turf Farms, Camarillo; Secretary **William H. Keyser,** Valhalla Memorial Park, North Hollywood; and Treasurer **Dan Castleberry,** Forest Lawn Memorial Park, Glendale.

The Council's nine-member board was completed with the installation of Directors **Dennis Frey,** Toro Pacific Distributing, Gardena; **Dave Mastroleo,** Hillcreast Country Club, Los Angeles; and **Don Schaich,** Stover Seed Company, Los Angeles.

Left to right: Outgoing President Gordon; newly-elected President Duling; Secretary Keyser, Treasurer Castleberry; and 1st Vice-President Cockerham.

Vernon L. Shallcross, Jr., has been appointed executive vice president of Green-Lawn, Inc., a professional lawn care company headquartered in Louisville, Kentucky. He will be responsible for administration and will operate out of the company's Tulsa, Oklahoma, office.

Shallcross said that the company plans to expand into several new markets in the coming year. "We see our largest potential to the south and west," he noted. "By dividing duties between the Louisville and Tulsa offices, we will operate more efficiently and be able to respond faster to opportunities in both old and new markets.

Green-Lawn currently has over 50,000 customers in Louisville and Lexington, Kentucky; Evansville, Indiana; Nashville and memphis, Tennessee; and Tulsa and Oklahoma City, Oklahoma. Green-Lawn also franchised its first market this year in Jackson, Tennessee. The company has technical arrangements with Green-Lawn operations in several other states.

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When they're up against a tough cutting battle, veterans reach for THE ULTIMATE WEAPON: a Weed Eater gas trimmer. For years, these rugged, reliable, and ready-to-go trimmers have engaged the thickest grass, weeds, and brush everywhere. And turned battlegrounds into parade grounds quickly and easily.

There are five different Weed Eater gasoline trimmers. Each armed with a powerful 2-cycle engine. And each is designed with features to complete a variety of grounds maintenance missions. Like the Tap-N-Go line feed on the Model 608. Or the big 4-exit cutting head on the Model 657. Or even the metal blade capabilities on many of the models.

Whatever the mission, Weed Eater gas trimmers will meet the challenge on any battlefront. That's why they're THE ULTIMATE WEAPON. Just ask any veteran.

For a full briefing on Weed Eater gas trimmers, write to: Weed Eater, Inc., P.O. Box 37347, Houston, TX 77036.

THE ULTIMATE WEAPON. COMBAT-PROVEN BY VETERANS.

Pictured left to right: Model 698, Model 608, Model 657, and Model 600. WEED EATER®, Inc., a subsidiary of Emerson Electric Co.

GROWTH IN TREE FERTILIZATION LINKED TO PROFESSIONAL METHOD

The value of property has risen significantly in the 1970s and with it the value of trees on property. It is curious why proper care of trees hasn't escalated at the same rate as property values.

A tree in the 15 ft. category installed easily costs the homeowner or business $80. A small investment in annual fertilization is more than just a good idea, it is insurance.

The success of lawn care companies suggests that property owners are aware of the increased value of their landscape. Shouldn't this same realization of worth effect the tree care business? Perhaps it has to a degree, but tree care business has not appeared on anyone's list of greatest opportunity lately.

Residential and small industrial maintenance had been left to the small landscaper until lawn care companies, some of which were landscapers, cut right in with lawn maintenance.

The same complete care package could work well for trees. The package could be pruning, fertilization, and repair of winter damage in the spring; insecticide and fungicide treatments in late spring and summer; and mulching, fertilizing, and necessary winter preparation in the fall. The entire program could be one contract at a price per visit.

But like lawn care, tree care will need a universal technology to blossom. Although many lawn care companies are dry, the liquid spray technology made it boom. It became a unique occupation with the emergence of the tank truck.

The same type of technology is needed for tree care to boom.

The choices of fertilizing established trees have increased in number in the past five years. Most recently developed are the tree spike or capsule and the slow-release, ground-injected suspension. The system of injecting fertilizers, insecticides and other chemicals directly into the tree is also relatively new.

Perhaps the oldest method considered professional is the drilling of holes for insertion of dry fertilizer. And lurking behind all these methods, is the very practical, extremely simple method of surface application.

The success of lawn care spray rigs can be attributed to speed of application, rapid and dramatic improvement in the customer's lawn, the outdoor advertising value of the tank truck, professional brochures, and the ability to plan routes accurately and efficiently.

The spray rig has been successful despite much higher equipment costs.

The companies who perform the same tasks with dry chemicals have adapted to the benefits of well-marked vehicles, reliable, one-man application methods, and efficiency. Another factor increasing efficiency is the routeman receives a healthy percentage of the business.

These same reasons for success can be utilized in tree care, when a dominant technology is chosen by professionals and recognized by the customer to be professional.

To determine the best, most professional method, each method must be examined for effectiveness, economy, and professional image. Comparative tests are needed which include all the methods.

Effectiveness

For established trees to achieve maximum health and growth, they should receive 5-6 lbs. of nitrogen per 1,000 sq. ft. of soil surface underneath. This area can be figured by multiplying the distance in feet from the trunk to the drip line (the radius) by itself, and then multiplying by 3.14 (known as pi).

For example, a tree that has branches extending out from the trunk 8 ft. would have surface area underneath totalling 200 sq. ft. (8 x 8 x 3.14 = 200). Consequently, the tree requires one lb. of nitrogen.

If the fertilizer being used is 10-5-5, then ten percent of the fertilizer is nitrogen, and ten lbs. of fertilizer need to be spread uniformly under the tree to give the tree one lb. of nitrogen.

All these figures can be computed ahead of time and made into a table (see table 1).

Not all methods of tree fertilization provide five lbs. of nitrogen when used as directed on the label, notably tree spikes and capsules. However, manufacturers of these products claim improved leaf growth and appearance of trees fertilized with their products. The question is, does the method provide improved growth and appearance to the level desired by a customer?

Tests have shown when nitrogen is applied at fractions of the recommended amount, it does not produce results proportionate to the fraction.

Also, it is recommended that a third to a quarter of the nitrogen be in slow-release form.

The amount of phosphorus and potassium does not appear to be critical in tree fertilization unless a deficiency exists. Generally, these elements should be a third of the nitrogen amount of the fertilizer (i.e. 12-4-4). It has been shown that phosphorus and potassium do not migrate to the roots as well as nitrogen, which limits their effectiveness when applied to the surface.

Economy

Two critical factors in the economy of a method are labor and equipment.

The only equipment needed to place tree spikes is a hammer. Surface application requires only a spreader.

Tree injection requires a drill (or hammer). Vertical hole drilling requires a large drill or rod (in soft soil).

Liquid injection requires the most equipment, including a pump, tank, agitator, and injection nozzle.

From a time standpoint, drilling methods take the most time. Tree spikes probably take the least, followed by surface application, and soil injection.

The two least costly methods appear to be spikes and surface application. However, spikes do not provide the recommended five lbs. of nitrogen, and are actually more expensive on a cost per lb. of nitrogen basis. Surface application carries the threat of burning out turf in the area around the tree.

Soil injection, whether with solutions or suspensions, is the next choice from a time standpoint. However, equipment costs are high.

So, we are back to drilling, thus the dominance in the recent past of the vertical hole method. Equipment costs are higher than spikes or surface, but only a fraction of a spray unit.

The concept of drilling into the tree has not really achieved customer acceptance. People have

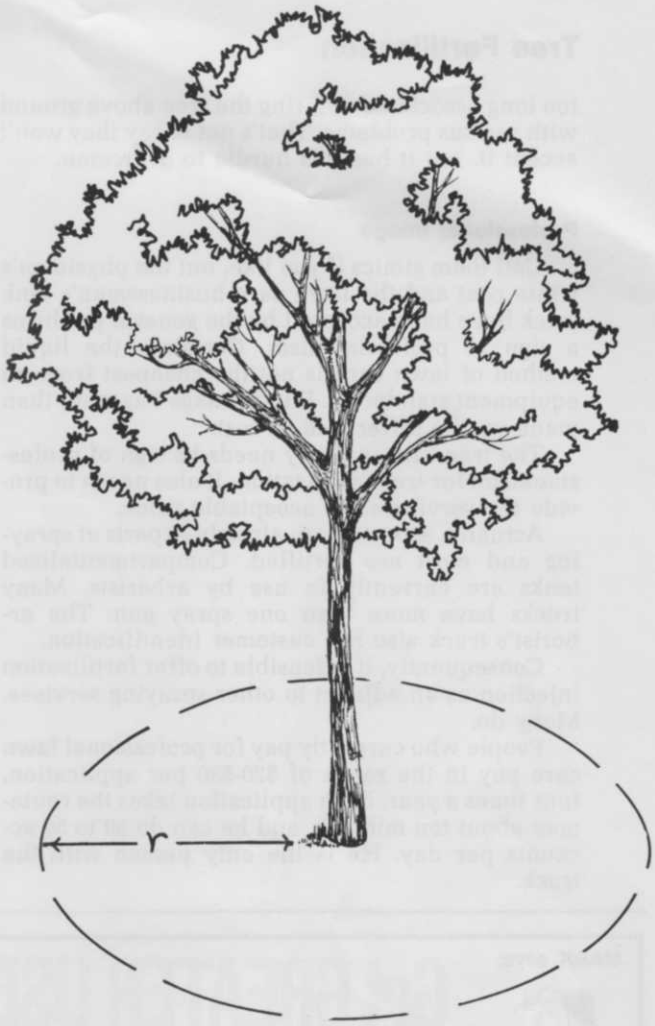

Table 1: Surface Area and Nitrogen Requirement According to Tree Size.

Radius*	Surface Area**	Nitrogen Needed	Lbs. N in Fertilizer	Lbs. Fertilizer Needed
3	28 sq. ft.	⅛	10	1⅓
			12	1⅜
			15	1⅛
5	78	½	10	5
			12	4⅙
			15	3⅓
8	200	1⅓	10	12
			12	10
			15	8
10	314	1 9/10	10	19
			12	15¾
			15	12½
12	452	2¾	10	27½
			12	22⅔
			15	18⅓
15	706	4¼	10	42½
			12	35¼
			15	28
18	1,017	6	10	60
			12	49⅔
			15	39⅔

* distance from trunk to drip line.

** r^2 x 3.14 (pi)

too long associated entering the tree above ground with serious problems. That's not to say they won't accept it, but it has this hurdle to overcome.

Professional Image

Call them gimics if you like, but the physician's white coat and the lawn care businessman's tank truck have been accepted by the general public as a sign of professionalism. Certainly the liquid method of lawn care is not the cheapest from an equipment standpoint. But its image has more than made up the difference in cost.

The tree care industry needs its sign of professionalism for tree fertilization. It also needs to provide the service at an acceptable price.

Actually, arborists are already experts at spraying and most are certified. Compartmentalized tanks are currently in use by arborists. Many trucks have more than one spray gun. The arborist's truck also has customer identification.

Consequently, it is feasible to offer fertilization injection as an adjunct to other spraying services. Many do.

People who currently pay for professional lawn care pay in the range of $20-$30 per application, four times a year. Each application takes the routeman about ten minutes, and he can do 30 to 50 accounts per day. He is the only person with the truck.

But, for a route devoted just to tree fertilization, the standard arborist vehicle and crew would be impractical. It is doubtful whether a homeowner will pay more for tree care than lawn care (fertilization only). A second type of vehicle specifically for one of the methods of tree fertilization is needed.

Professional image is difficult to earn when the person is doing essentially the same thing that a customer can do himself. This includes spikes, surface application, to an extent vertical hole punching and foliar spraying. Foliar spraying has not done well in tests either.

The most unique method having the characteristics necessary for customer identification is the soil injection method. If this method could be developed into a route similar to lawn care, there may be great potential.

The vehicle must be unique and attractively marked, operated by one person, and efficiently routed. Promotion must be high quality. Route managers must be rewarded well for their efforts.

This type of large scale marketing may be too much for some firms, but lawn care has shown it can be done. Volume is the only way to keep prices down at an acceptable level.

There is a need for professional tree fertilization, but it hasn't yet been put into a form that customers will readily accept and then demand.

Bruce Shank

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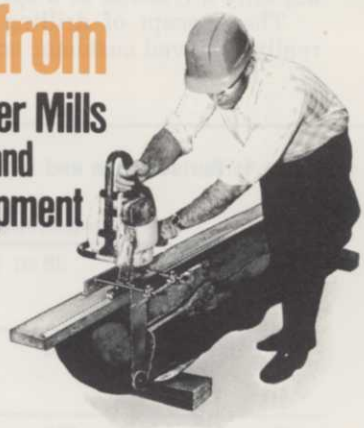

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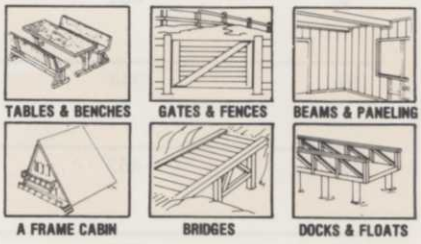

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PROFILE

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SOD PRODUCERS PLANT FEWER ACRES IN 1978

Approximately 1,200 companies grow $225 million worth of sod each year according to a survey of 144 sod producers by Weeds Trees & Turf.

In the process, sod producers spend $6.6 million for seed, $15 million for fertilizer, and $3.9 million on chemicals each year.

More than 700 U.S. sod producers were mailed questionnaires for this survey. Twenty percent returned them.

The universe of 1,200 sod companies was derived from input by the American Sod Producers Association and suppliers. Those considered actual sod farmers either have sod production as a primary source of revenue or farm a significant amount of sod acreage. Significant in this case would be more than 20 acres. Many nurseries grow a few acres of sod as a sideline to wholesale or retail business. For this survey, such nurseries were not included.

A value of $1,500 per acre of sod produced was used to calculate gross revenue. This figure is a moderate estimate based upon data from Maryland (see article page 33). Value per acre has been reported as high as $2,200 and as low as $1,300.

The average sod farm is 290 acres from which 112 acres of sod was sold in 1977 at a value of $168,000. Using median figures, the typical sod farm is 150 acres from which 70 acres was harvested in 1977 at a value of $105,000. A few sod farms in the 800 to 1,500 acre range inflated the average. The average staff is six full-time and seven part-time employees.

According to these figures, sod growers harvest between a third and a half of their acreage annually. They expect to sell between 10 and 15 percent more acreage in 1978 than in 1977. However, respondents planted 15 percent less acreage in 1978. Perhaps this is in response to a predicted downturn in building starts.

Landscape contractors are the largest purchasers of sod, followed by homeowners and builders. Nearly two-thirds of sod growers sell to retail nurseries and 56 percent sell to wholesale nurseries. Athletic fields (58 percent) and golf courses (51 percent) are major buyers of sod.

Sod growers indicated that Tifway is the most common bermudagrass for sod, Penncross is the most common bentgrass, Pennlawn is the most common fescue, Manhattan is the most common ryegrass, Floratam is the most common St. Augustine grass, and Meyer Z-52 is the most common Zoysia.

Bluegrass, of course, is the dominant type of sod produced. Baron ranked number one with 47 percent of the growers. Merion still places strongly in second (27 percent), Fylking third (26 percent), Glade fourth (25 percent), and Adelphi fifth (23 percent). The Maryland article in this issue points out that most sod today contains mixes and blends of varieties. The amount of single variety sod grown has dropped dramatically in the last ten years.

The average sod grower spends approximately $30,000 annually for seed, fertilizer and chemicals. Using the average acreage of 290, the average material cost per acre is $103. The largest part of this cost is fertil-

Annual expenditures projected for 1,200 sod producers.

	%	Range	Median	Mean	Projection
Fertilizer	87	$ 75-$140,000	$7,000	$14,465	$15,000,000
Fungicide	25	$100-$ 27,000	$ 500	$ 2,198	$ 660,000
Herbicide	74	$ 20-$ 35,000	$2,000	$ 3,604	$ 3,200,000
Seed	58	$250-$ 85,000	$6,000	$ 9,505	$ 6,600,000

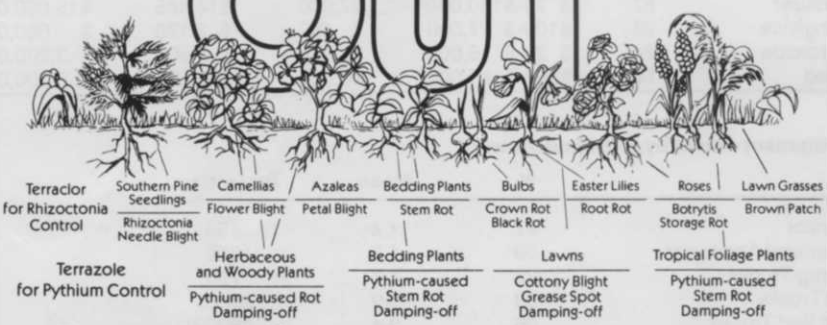
Equipment owned by 1,200 sod growers.

	%	Mean	Projection
Aerator	27	1.4	450
Chemical Applicator	69	1.5	1200
Dump Trucks	36	1.7	730
Lift Trucks	58	3.3	2300
Flat Bed Trucks	66	2.4	1900
Pickup Trucks	81	2.9	2800
Trailer Trucks	44	2.7	1400
Flail Mowers	49	1.4	820
Rotary Mowers	58%	1.6	1100
Reel Mowers	42	4.6	2300
Gang Mowers	64	4.6	3500
Fertilizer Applicators	71	1.8	1500
Small Utility Vehicles	21	2.0	500
Sod Cutters	71	2.3	2000
Self Contained Sod Harvesters	47	1.8	1000
Tractor Drawn Sod Harvesters	17	1.7	350
1-25 h.p. Tractors	33	1.7	670
26-50 h.p. Tractors	79	3.5	3300
51-100 h.p. Tractors	57	2.4	1600
100+ h.p. Tractors	22	1.9	500

Projected totals of acreage of sod farms.

	Projected to 1,200 farms
Total Acreage	349,000
Acres Planted in 1978	128,000
Acres Harvested in 1978	150,000
Acres Sold in 1977	135,000

AW, CUT IT OUT



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Survey

izer ($50), followed by seed ($33) and then herbicides ($12). An average of $7.50 per acre is spent for fungicides.

The 1,200 sod producers own 3,350 harvesters and cutters, 6,070 tractors, 7,720 mowers, 2,300 lift vehicles, 2,800 pickup trucks, 1,900 flatbed trucks, 1,500 fertilizer spreaders, 1,200 spray rigs, 1,400 trailer trucks, and 450 aerators. A conservative value of equipment inventory of the average sod producer is $250,000. **WTT**

Types of seed used for sod and number of respondents indicating use.

BERMUDA 19%	
Tifway 419 or 328	22
Santa Ana	3
PD 102	2
Tiff Green	4
Midiron	2
Coastal	1
Common	2
BENT 3%	
S71	1
Penncross	3
Seaside	1
Toronto C-15	1
BLUEGRASSES 67%	
Baron	47
Merion	27
Glade	25
Fylking	26
Adelphi	23
Victa	15
Park	10
Windsor	6
Newport	8
Touchdown	7
Majestic	12
Pennstar	5
Others	33
Blends	34
FESCUE 15%	
Pennlawn	5
Jamestown	2
K 31	4
Creeping Red	3
RYEGRASS 6%	
Manhattan	4
Citation	1
Pennfine	2
ST. AUGUSTINE 10%	
Floratam	8
Bitter Blue	4
Living Carpet	1
Blue-Green	1
Common Texas	1
ZOYSIA 12%	
Emerald	11
Meyer Z-52	15
Metrella	2
ARGENTINE BAHIA 2%	
CENTIPEDE 12%	

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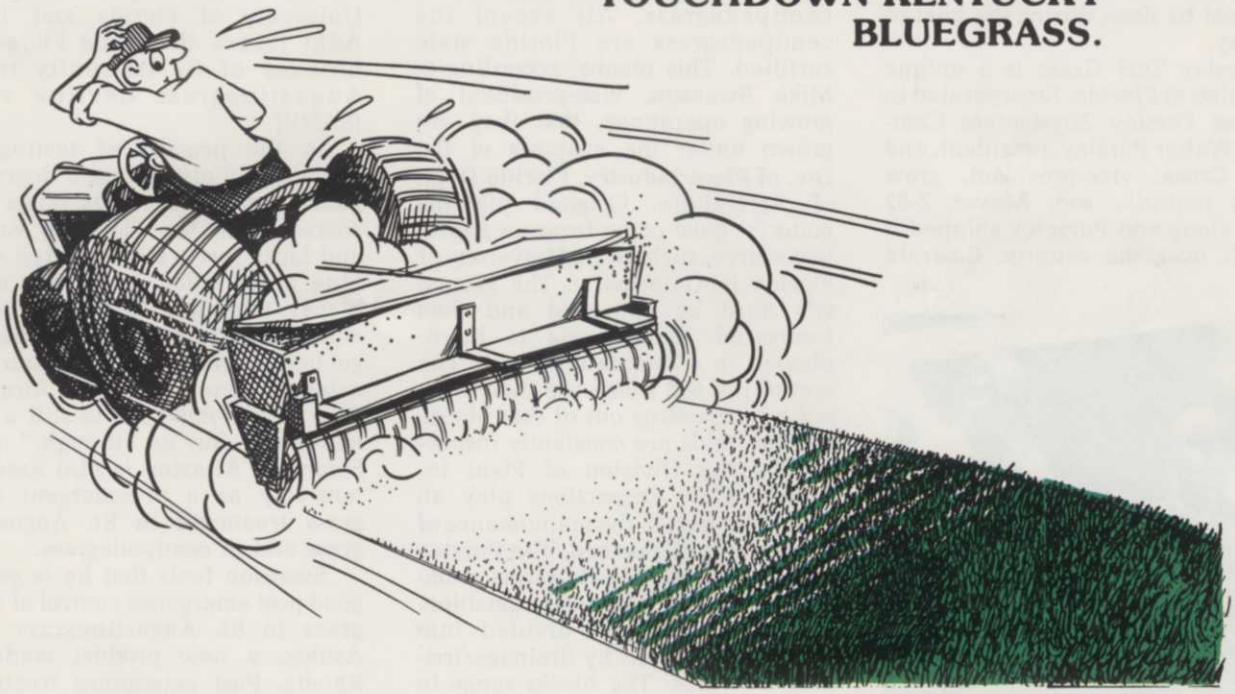

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PURSLEY TURF GRASS: WARM CLIMATE SOD SPECIALISTS

Florida in the summertime is hot and humid. Away from Disney World, Floridians relax in air conditioned cars and buildings. Except for armadillos, cattle egrets, an occasional sandhill crane . . . and sod farmers!

Just outside of Palmetto, not too far from the Gulf coast, 1,200 acres of sod keep 33 people working long hours. Planting, mowing, fertilization, irrigation, harvesting, and hauling must be done during the heat of the day.

Pursley Turf Grass is a unique operation in Florida. Incorporated in 1956 as Pursley Zoysiagrass Company, Walter Pursley, president, and Stan Cruse, vice-president, grew *zoysia matrella* sod. Meyer Z-52 came along and Purseley shipped it out all over the country. Emerald was the next successful zoysiagrass. Sod farming became a large industry and Pursley grew with it. With successful endeavors into golf course construction, land development, and retail nurseries, Pursley Turf Grass also produces some of the best, certified sod in Florida.

Mike Swanson (left), vice-president of growing operations, and Stan Cruse, president of Pursley Turf Grass.

Today Pursley Turf Grass grows Emerald, Argentine Bahia, four varieties of bermudagrass, two varieties of St. Augustine grass and centipedegrass. All except the centipedegrass are Florida state certified. This means, according to Mike Swanson, vice-president of growing operations, that they are grown under the auspices of the Div. of Plant Industry, Florida Dept. of Agriculture. Original planting material must come from an approved source, such as the University of Florida in Gainesville. The ground site must be approved and then fumigated. Each sprig is hand-planted in a foundation block. The rest of the sod fields are then planted by expanding out of that block.

The fields are constantly inspected by the Division of Plant Industry. Their inspections play an important part in the maintenance of Pursley Turf Grass sod. The Pursley acreage is divided into farms, numbered in the order of acquisition. Each farm is then divided into blocks, delineated by drainage/irrigation ditches. The blocks range in size from two and one-half acres up to 38 acres. Swanson treats each block as an individual entity, keeping a complete history of progress and treatment of each.

A soil sample is prepared from each block. According to Swanson, they generally indicate a need for lime. In addition to standard N-P-K tests, Swanson also keeps track of copper, calcium and magnesium. Some of the land has been used in the past for tomato production," says Swanson, "and we find real high copper readings." I've also run into problems such as where we ran a soil test on a block and it looked good. There was one area within the block, though, where centipedegrass just wouldn't grow. We went in and sampled just that one area and found a phosphorus level of 4. We had to redo about a half acre within the block, made a correction for phosphorus deficiency and the grass filled in beautifully."

Weeds are a big headache in growing southern turf species. "Probably the biggest single problem here," indicates Swanson, "is nutsedge. We have both varieties, yellow and purple." Floratum St. Augustinegrass lends itself well to control of yellow nutsedge. The variety was developed through the University of Florida and Texas A&M (hence the name Flora-tam) because of its immunity to St. Augustinegrass decline virus (SADV).

In the process of testing for SADV, they also found a degree of resistance to chinchbugs. It is a little coarser than the Floratine variety and lacks just a slight degree of its blue green color, but has a much higher tolerance to the herbicide Atrazine. "We have found that we get better yellow nutsedge control by using an increased rate of Atrazine. The purple nutsedge is still a real headache for us, though," adds Swanson. Atrazine is also used extensively as a preemergent crabgrass treatment in St. Augustinegrass and in centipedegrass.

Swanson feels that he is getting good post emergence control of crabgrass in St. Augustinegrass with Asulox, a new product made by Rhodia. Post emergence treatment on bermudagrass is either MSMA or DSMA in conjunction with 2,4-D.

Even though the blocks are fumigated before planting, there are still weed problems. The sod farms are surrounded by farmland and weed seeds are carried in by the irrigation water, by birds and by the wind. Swanson has a full time roguing crew to see that the fields are kept perfectly clean. The crew members also carry flags and if they run into a particular type of weed that they don't want to take a chance on digging out, they flag it. Someone will then come through with a small sprayer and spot treat the area.

"Bermudagrass is one example," says Swanson. "If you get it in St. Augustinegrass, it is extremely difficult to mechanically remove with a roguing tool. If the person leaves just one little node, then he's wasted his

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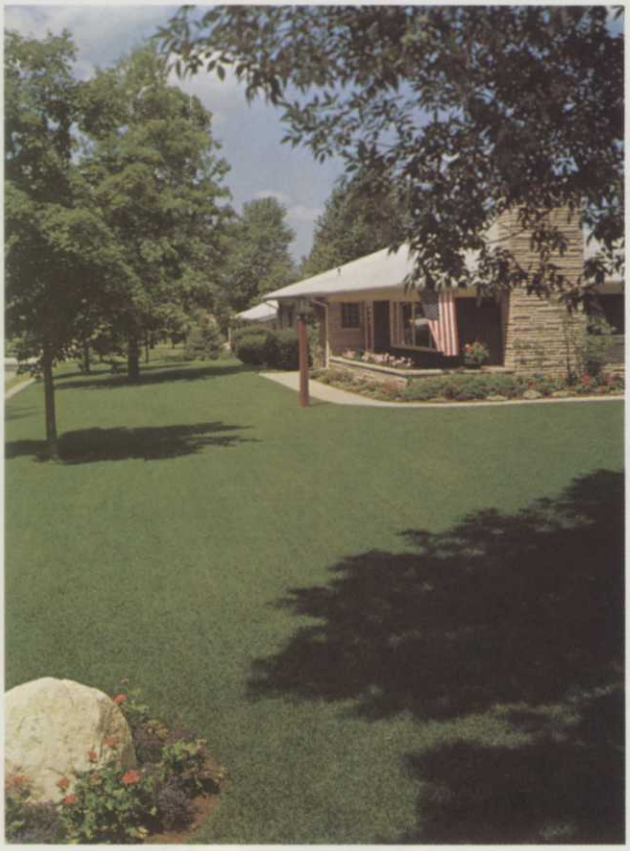

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The biggest breakthrough in the greening of America began in 1970. That's when turfgrass specialists at Pennsylvania State University completed development of a remarkable fine-leafed perennial ryegrass with all the advantages of ryegrass. And none of the drawbacks. They called it Pennfine.

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Proven in tests. Among the nine perennial ryegrasses tested over a five-year period at University Park, Pennsylvania, Pennfine ranked finest in texture. Most resistant to disease. First in density and decumbency (low growth).

The University Park test results were only the beginning. Over 5,000 test kits with seed samples were distributed over the entire country in answer to requests from turf professionals wanting to test Pennfine. The results confirmed the University Park findings.

Most importantly, Pennfine established a new standard of mowability. Some other perennial ryegrasses, cut with the same mower, left ragged, fibrous tops that quickly turned brown. Pennfine's softer fibers cut smooth and clean.

Proven from coast to coast, from North to South. Pennfine's durable beauty has been demonstrated at prestigious sites all over America. From the lawns at an historic national landmark to the greens at a nationally-renowned golf course.

Besides possessing the ability to stand up under heavy traffic, Pennfine germinates rapidly. That makes it ideal for winter overseeding in the South. And, its non-competitiveness allows a smooth spring transition to bermudagrass.

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time. Torpedograss is another weed that is tough to get. We find roots 8-12 feet down when we dig irrigation ditches."

Swanson has had good luck with Roundup for problems like those. "Roundup suits a very specific purpose for us, as an in-field control of contamination. Of course, we might not get any grass out of the area where we've sprayed, but we don't inadvertently send weedy sod out." Often, because Roundup has hardly any residual effect, the grass will begin to fill back in.

The chemical itself is still expensive, about $55-60 per gallon. At higher rates, it takes about five quarts to treat an acre. However, the price has decreased substantially from the original $85 per gallon when Roundup was first introduced.

Broadleaf weeds are not much of a problem at Pursley Turf Grass. "We're constantly mowing," says Swanson. "Unless we get caught by the rain and can't get into the fields. The Atrazine is effective on broadleaf weeds.

A full-time mechanic and assistant mechanic take care of almost a million dollars worth of equipment at Pursley. The inventory includes three Princeton harvesters originally $29,000 apiece. A fourth, tractor-drawn harvestor has been added. Thirteen John Deere tractors are maintained. A 60-hp model currently sells for about $13,000.

"Because equipment costs are going sky high," laments Swanson, "we do all the preventative maintenance we can. We have even taken two or three of our older tractors and completely refurbished them in our shop, right down to a paint job and new seat. We're talking $1500 versus $12-13000 for a new one."

One of Pursley's three Princeton harvesters in action (below). Roguing crews work near ditches used for drainage, irrigation and to separate fields.

Much of the Pursley Turf Grass acreage is reclaimed bayheads. Often, in order to keep the land dry, a small lake has been dug to provide fill. The topsoil was pushed off and then spread back over the fill.

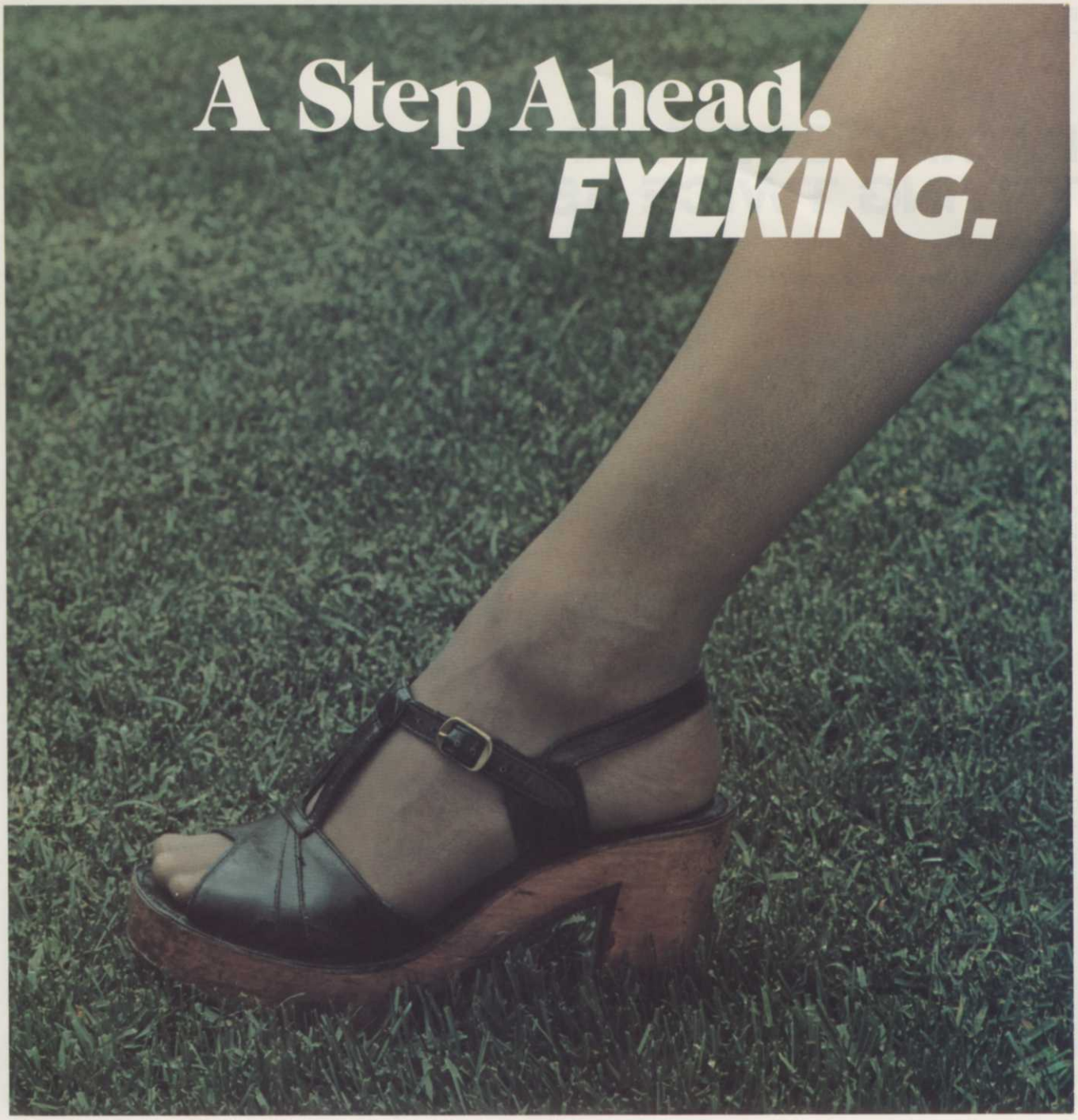
These ponds, and other natural ones, provide ideal irrigation sources. Drop a portable pump in a pond and turn the sprinklers on. A stationary system is used until the runners fill in enough to support traveling sprinklers. If necessary, water can even be pumped from pond to pond.

The ditches around each block serve a dual purpose. During heavy rains, they help carry water away. During the dry season, they become irrigation ditches.

Disease could be a problem, but doesn't go long unchecked. Gray leaf spot on St. Augustinegrass and dollar spot on bermudagrass are the most common, according to Swanson. "We also treat every block of grass we send out," adds Swanson, "whether it needs it or not. The critical factor in sod installation is that consumers get plenty of water on it. Even at this time of year, when we're getting plenty of rain, its extremely deceptive. You might get an inch of rain, then the sun comes out and it evaporates. Very little actually gets to the rootzone. Asking the consumer to keep it moist creates conditions for fungus. We want to see it get off to a good start."

The sod is harvested in 16-inch by 24-inch pieces, stacked 400 square feet to a pallet. Each pallet weighs approximately 3,500 pounds, depending upon moisture content, and weight restrictions generally limit a truck load to 16 pallets. All of the sod is cut to order. "That avoids having any grass around that's not 100 percent fresh," says Swanson. Pursley Turf Grass hasn't had to worry about having any old grass around for the last two years.

Because of the extra care and expense Pursley Turf Grass puts into their product, it naturally sells for a higher price. There is a good market, however, for quality sod and they've proved it. "One of the pleasant discoveries in this business," sums up Swanson, "is that people are willing to pay for quality." *Ron Morris*



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PACIFIC SOD FARMS: TRYING TWICE AS HARD

Effective management, careful attention to cultural practices, regulated growth, and a professional understanding of the needs of the ornamental horticulture industries in California are the reasons for the ten-year success story of Pacific Sod Farms, Camarillo.

Starting with 38 acres of leased land on the Davis Ranch in Ventura County in 1968, the company has become one of Southern California's leading suppliers of sod in 1978, with 394 acres of bluegrass, hybrid bermudagrass, and other varieties under cultivation.

Pacific Sod's 394 acres give it a No. 3 ranking in the California sod industry, just behind Cal-Turf and Nunes Turfgrass, and makes it typical of the many mid-size sod companies in America.

"Everybody has heard the slogan that when you're No. 2, you try harder," says Lawrence R. Hart, vice president and corporate general manager of Davis Pacific Corp., and its subsidiary, Pacific Sod Farms.

"However, our company philosophy is that when you're No. 3, you try twice as hard. This, more than anything, is the reason for the success of Pacific Sod Farms."

Vacuums clean up after mowing. A land plane is used to smooth the surface for seeding.

And Pacific Sod's determination to try harder in the highly-competitive California sod business is paying off.

Now enjoying the best year in its history, Pacific Sod manages to keep its eleven 40-ton Peterbilt trucks on the road constantly, delivering sod to customers from Santa Maria to San Diego, the entire length of Southern California.

To keep these customers happy, Pacific Sod grows seven different varieties of turfgrass, and literally delivers them to the customers' "front doortstep" to meet most installation deadline requirements.

Of Pacific Sod's 394 acres, 210 are devoted to bluegrass, which has the greatest demand in Southern California. The rest of the acreage is divided as follows: Tifgreen, 85 acres; dichondra, 35 acres; Santa Ana, 30 acres; Bluerye, 15 acres; Tifdwarf, 10 acres; and St. Augustine, 8 acres;

Tifgreen, Santa Ana, and Tifdwarf are hybrid bermudagrasses, while dichondra, Bluerye, and St. Augustine are special varieties grown for special purposes.

According to Hart, professional landscape contractors in Southern California are Pacific Sod's biggest customers, accounting for 54% of the company's total sod sales.

The remaining sales are broken down as follows: sod brokers, 19%; retail nurseries, 11%; distributors, 9%; builders-developers, 5%; and

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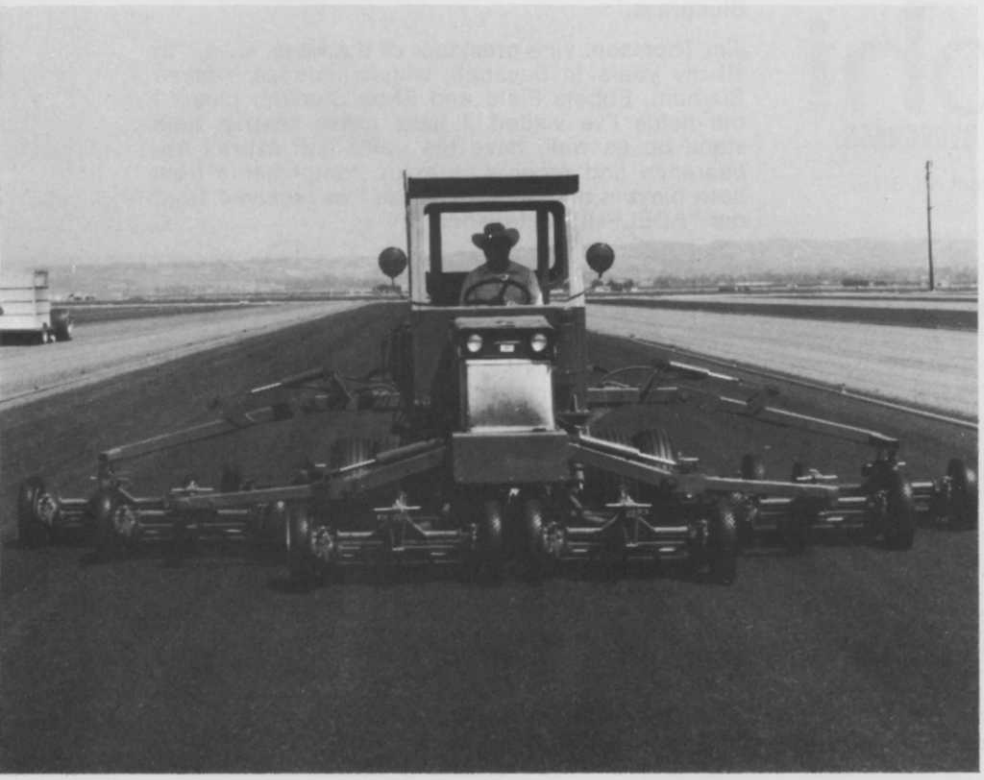
One of two Ford/Brouwer harvesters used by Pacific Sod Farms.

A John Deere tractor and tiller prepare part of Pacific's 400 acres of fields for seeding.



A seven-gang Jacobsen mows between irrigation lines as a vacuum follows in the next row.

all others, 2%. In the latter category are golf courses, parks & recreation departments, and governmental agencies on the city and county levels.

Pacific Sod has 51 permanent and 20 seasonal employees, with Larry Hart and Walt Flowers directly involved in the management of the company. Flowers is vice president of the Davis Pacific Corporation's farming operations in Ventura County, and also serves as Pacific's farm manager.

The company takes great pains to keep its cultural practices up-to-date, and utilizes a variety of equipment to maintain and harvest the sod.

This includes Jacobsen and Roseman mowers, Nunes and Rake-o-Vac sweepers, two Ford tractors equipped with Brouwer harvesters, a D4 Caterpillar tractor, tractors from John Deere, Massey-Ferguson and Allis-Chalmers, a 40-foot Marvin land plane, a 500-gallon Master spray rig, and other highly specialized items.

Pacific Sod was founded in 1968 by five Ventura investors, who successfully operated the company for three years, then sold their interests in December, 1971.

For the past seven years, the company has been owned and operated by the Davis family, pioneer settlers in Ventura County, and their major farming enterprise, the Davis Pacific Corporation. With their deep agricultural roots in the county, the Davis family brings more than a hundred years of farming tradition and experience to the highly successful Pacific Sod operation.

In its continuing program of improving its product and operations, Pacific Sod has undergone extensive reorganization and revitalization during the past two years.

The company has computerized its accounting system, modernized its business operations, and expanded its services to customers. In addition, it has developed and purchased new equipment, and inaugurated better cultural practices to assure uniform, high quality standards of sod production.

On August 22nd, Pacific Sod will celebrate its tenth anniversary, and launch its second decade of service to the landscape and ornamental horticulture industries. **WTT**

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MARYLAND NOTES CHANGES IN SOD PRODUCTION SINCE 1968

By J. Thomas Gilbert, Jr. and Billy V. Lessley[1]

This is the first in a series of three articles about the structure and costs-returns for sod production in Maryland. This article introduces the sod industry's characteristics in Maryland, the second provides costs-returns per acre for sod produced and marketed on an unharvested basis and the third presents costs-returns data for the integrated sod industry to include production, harvest and delivery. The data are based on a research project conducted for the 1976 crop year through the Maryland Agricultural Experiment Station.[2] The objectives of the project were to: (1) present a general description including size and scope, organization, operation, investment and economic impact of the commercial turfgrass industry in Maryland, (2) develop cost and return data for different sizes of sod farms as well as different systems of harvesting and transporting sod, (3) determine economic profitability of marketing sod by alternative marketing systems, and (4) compare 1976 costs and returns to costs and returns identified in a similar study conducted for the 1968 and 1969 crop years.

In 1976, sod was produced by 63 growers in 16 counties in Maryland. The largest acreage, as well as the largest number of producers, was found in those counties lying within and near the Baltimore and Washington, D.C. metropolitan areas. Montgomery, Howard and Harford counties had 55 percent of the turfgrass producers and 63 percent of the total cultivated acreage. There were an estimated 8,712 acres of sod produced with 2,497 acres of these being harvested and sold. These acreages include an estimated 2,078 acres produced and 611 acres sold by seven producers who chose not to cooperate in the study. Total gross receipts at the farm level amounted to approximately $5.4 million.

The remainder of this article will only report data provided by the "identified" 56 cooperating producers.

The most important variety of sod in terms of acres grown and total sales was a 30-30-30-10 percent mixture of Merion Kentucky Bluegrass, South Dakota Kentucky Bluegrass, Adelphi Kentucky Bluegrass and Red Fescue. Fourteen producers grew 1,179 acres of this mixture and sold 322 acres for $616,515, or an average of $1,915 per acre. This mixture was followed closely by 1,077 acres of the 30-30-30-10 percentage mix of Merion, South Dakota and Fylking Kentucky bluegrasses and Red Fescue. Approximately 368 acres of this mix were sold for $505,432, or an average of $1,373 per acre. Relative to acres produced, the above two variety mixtures accounted for 34 percent of the total acreage grown by the 56 producers.

Since 1969, varieties and especially mixtures of turfgrass varieties grown in Maryland have changed dramatically. In 1969, single variety turfgrasses grown by participating growers accounted for 5,366 acres, or 54 percent of the total acreage. In 1976, single varieties accounted for only 525 acres, or eight percent of the identified acreage produced. The phasing out of single variety turfgrasses by the adoption of multi-varital mixtures has come about for several reasons. At the recommendation of the Turf and Seed Certification Section of the Maryland Department of Agriculture, growers were and are producing mixtures that are more sun tolerant and disease resistant than single varieties. However, the main reason for the dramatic change from 1969 has been the adoption and application of the Maryland Sod Certification Program which establishes certain specifications and requirements pertaining to the composition of variety mixtures.

The 30-30-30-10 and 40-40-20 percent variety mixtures of Kentucky bluegrasses and Red Fescue produced in Maryland in 1976 were sold extensively for use in housing and industrial landscaping development where purchasers were willing to spend more money to establish a nice lawn with moderate management.

Kentucky-31 Tall Fescue with a Kentucky bluegrass variety was used considerably in full sun areas where lack of water could be a problem. In terms of production, most of the Kentucky-31 tall fescue dominated mixes were grown on the Eastern Shore of Maryland.

Common Kentucky Bluegrass, a relatively cheaper grass, has not been recognized as a possibility for certification. It was generally used on small landscape jobs or on large tract housing projects where people were trying to get a quick stand of grass to prevent erosion.

Other grasses such as Tufcote Bermudagrass and Zoysia are specialty grasses which have fairly limited markets and are confined to especially dry areas where it is not too cold in the winter.

The 56 growers who cooperated in this study produced 6,634 acres of turfgrass of which 1,886 acres or 28.4 percent were harvested. The distributions of turfgrass produced and harvested are reported in Tables 2 and 3.

For the study, various farm size groupings were developed to measure difference in structure and cost-return information by farm size. The size groups were: less than 100 acres, 100-150 acres, 151-300 acres, and greater than 300 acres. The grouping resulted in a distribution of a few farms with more than 300 acres and a large number of farms with less than 100 acres of cultivated turfgrass. Eight growers with farms in the largest acreage category

[1]Research Assistant and Professor, Department of Agricultural and Resource Economics, University of Maryland.
[2]Scientific Article Number A2480, Contribution Number 5510 of the Maryland Agricultural Experiment Station, Department of Agricultural and Resource Economics.

produced 48 percent of the 6,634 identified acres in production while 35 growers in the smallest acreage category produced only 17 percent of the total cultivated acreage. Of the 35 growers, 24 had turfgrass operations of 40 acres or less. These 24 produced 427 acres of turfgrass, or only 6 percent of the total identified acreage.

Harvest intensity reported in Table 3 was calculated as a percent by dividing net acreage harvested for each group by the combined net acreage under cultivation for each group. One might expect harvest intensity to increase as farm size increases. However, this was not portrayed in the industry. The largest farms, those with more than 300 acres of turfgrass, accounted for 48 percent of the identified turfgrass grown but harvested only 26.7 percent of their combined acreage, even though they accounted for 45 percent of the identified harvested turfgrass. Farms with 151-300 acres grew 23 percent of the identified turfgrass and harvested 33.7 percent of the acreage within their farm category to account for 28 percent of the State's identified acreage. The smallest farm size category produced only 18 percent of the identified turfgrass in Maryland in 1976, but harvested and sold 29.7 percent of their acreage. Farms with 100-150 acres had the lowest harvest intensity of 22.9 percent and reduced the State harvest intensity for all farms of identified acreage to 28.4 percent. The lack of a uniform harvest intensity or natural increase can be explained by several factors.

First, in the less than 100 acre category, 24 of the 35 farms had 40 acres or less and generally either treated sod as a secondary enterprise or had engaged in the production of sod and could not get it marketed because of problems in the original production of the crop. Interestingly, five of the farms were considering discontinuing production for the 1977 season. Too, a few were speculating on land while using sod as a crop for low maintenance after the initial stages of establishment.

Secondly, six farms in the size group of 100-150 acres of turfgrass had farms or other enterprises large enough to treat sod as secondary. Also, the majority of producers in this group did not strive to produce Maryland certified sod.

Turfgrass producers on the seven identified farms with 151-300 acres sold 521 acres and served to increase the average harvest intensity for all farms. However, six of these seven farms were characterized as having a very good marketing organization. The other grower discontinued business in 1976 and reported selling acreage for a substantially reduced price.

Table 2. Identified Acreage of Cultivated Turfgrass by Size of Farm, 1976

Farm Size (Net Acres of Turf)	Number of Growers	Combined Net Acres of Cultivated Sod	Average Acres Per Farm	Percent of Total Acres Accounted for by Each Group
Less Than 100 Acres	35	1,133	32.4	17.08
100-150 Acres	6	765	127.5	11.53
151-300 Acres	7	1,547	226.5	23.32
Greater Than 300 Acres	8	3,189	398.6	48.07
All Participating Growers	56	6,634	118.4	100.00

*There were seven producers who chose not to cooperate in the study.

Table 3. Acres of Identified Turfgrass Harvested by Size of Farm, 1976

Farm Size (Net Acres of Turf)	Number of Growers	Number of Growers Who Also Harvested	Combined Net Acres of Harvested Sod	Average Acres Harvested per Farm	Harvest Intensity (Percent)	Percent of Total Harvested Sod Accounted for by Each Group
Less Than 100 Acres	35	21	337	9.6	29.7	17.85
100-159 Acres	6	4	175	29.2	22.9	9.28
151-300 Acres	7	3	521	74.4	33.7	27.63
Greater Than 300 Acres	8	6	853	106.6	26.7	45.24
All Participating Growers	56	34	1,886	30.5	28.4	100.00

There were seven producers who chose not to coperate in the study.

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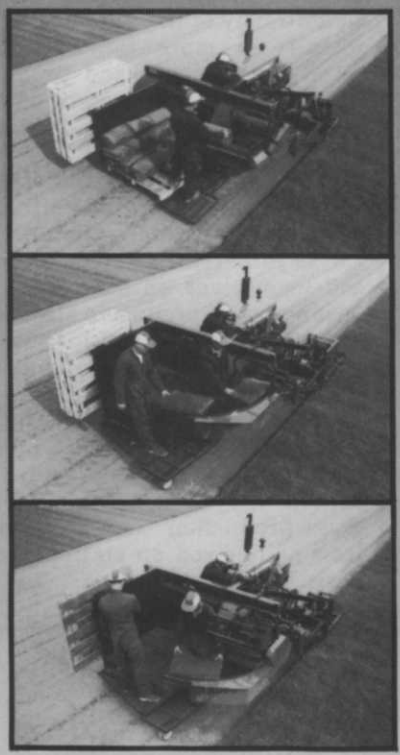

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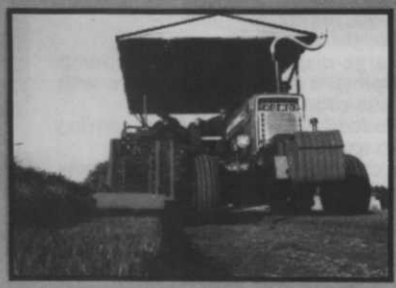

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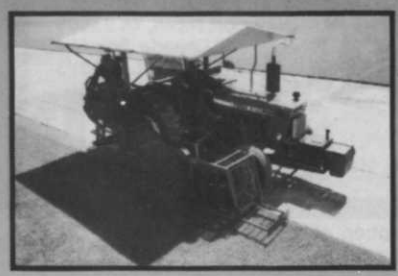

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Maryland Sod Industry

Finally, a factor contributing to uneven industry distribution and different levels of production-harvest intensity was the higher degree of vertical integration which existed on the largest turfgrass farms. Of the eight producers identified in this group, six harvested their own sod and five had a landscape company tied directly to the sod farm. Consequently, a more intensely monitored management and production program was ever present on these farms to insure sufficient quantity and quality of turfgrass.

Table 3 also shows that of the 56 turfgrass producers identified, 34 had integrated their operations so far as to harvest some or all of the sod themselves. In addition to harvesting, some producers also loaded and delivered the sod for the final buyers. The structure and cost-return information for these vertically integrated services will be the subject of the third article while the next article will primarily be concerned with a discussion of turfgrass production costs and returns from selling sod on an unharvested basis. **WTT**

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PROSCAPE

By **Michael Hurdzan,** Ph.D., golf course architect and consultant

Q. *What is your opinion of plastic liners under sandtraps for weed control?*

A. The use of plastic sheets under the sand in sandtraps has been tried for a number of years with varying results. The theory is that by placing a physical barrier between the soil subgrade of the trap and the sand, weeds would be shallow-rooted and easier to control and underlying soils would not contaminate the sand. In theory this seems sensible, but as a practical matter often less than exciting results are obtained.

First, there is the problem of properly placing the plastic film on the trap floor. In new construction, it is simply laid on the base grade and the edges cut off just below the sand surface or tucked back into the topsoil. The ideal method is to tuck the edges into the topsoil about 7-8 inches below grade.

Once the plastic sheeting is installed, small holes must be made in the plastic to allow water movement to the tile drains. If these holes are too big they reduce the benefit of the plastic liner and if they are too small then they impede drainage.

After installation of the plastic is complete and the sand is placed over it, wind and water erosion or golfer use can expose the plastic to snagging. This is particularly true on slopes and crowns within the trap that commonly become devoid of sand.

Based on these observations, I suggest one might be better off to use the funds allocated for plastic installation to simply buy more or better sand and try to achieve a minimum sand depth of 6-8 inches, which will resist weed growth and keep the sand surface loose.

There is one instance where I would strongly suggest the use of plastic film as liners for sandtraps. This is where the sandtrap is placed so close to the green that when the sun heats up the exposed sand surface and causes rapid surface evaporation, it wicks water away from the surrounding soils. This situation is further complicated because of the accumulation of sand blasted out of the trap often produces a droughty soil profile. If a plastic liner were installed under this exposed sand face it would reduce the need for spot watering these dried areas and would result in a more attractive turf area. **WTT**

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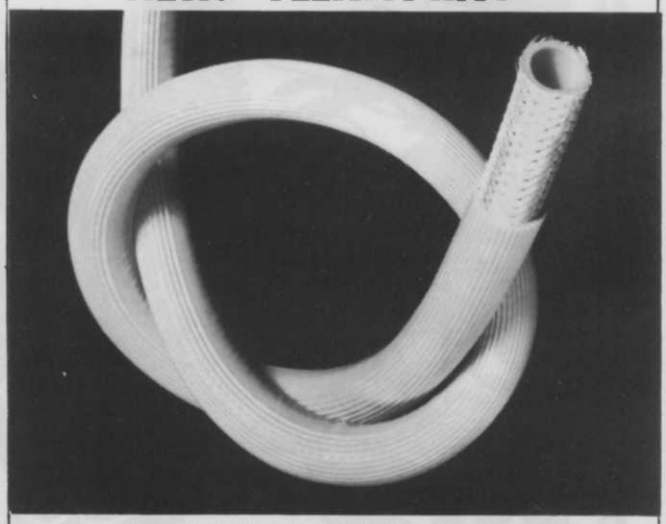

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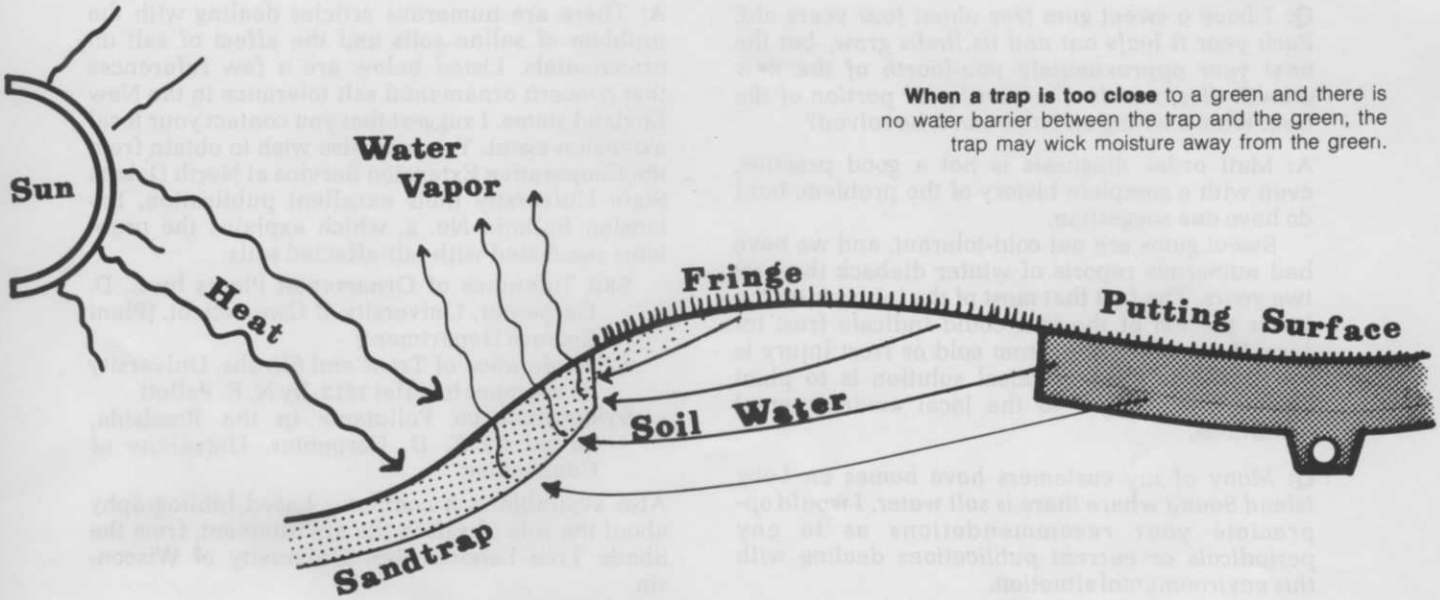

When a trap is too close to a green and there is no water barrier between the trap and the green, the trap may wick moisture away from the green.

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VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *I have a sweet gum tree about four years old. Each year it leafs out and its limbs grow, but the next year approximately one-fourth of the new growth dies, mostly near the lower portion of the tree. What's wrong and how can it be solved?*

A: Mail order diagnosis is not a good practice, even with a complete history of the problem, but I do have one suggestion.

Sweet gums are not cold-tolerant, and we have had numerous reports of winter dieback the past two years. The fact that most of the injury is on the lower portion of the tree could indicate frost injury. Protecting a tree from cold or frost injury is difficult. The most practical solution is to plant trees more adapted to the local environmental conditions.

Q: *Many of my customers have homes on Long Island Sound where there is salt water. I would appreciate your recommendations as to any periodicals or current publications dealing with this environmental situation.*

A: There are numerous articles dealing with the problem of saline soils and the effect of salt on ornamentals. Listed below are a few references that concern ornamental salt tolerance in the New England states. I suggest that you contact your local extension agent. You may also wish to obtain from the Cooperative Extension Service at North Dakota State University their excellent publication, Extension Bulletin No. 2, which explains the problems associated with salt-affected soils.

Salt Tolerance of Ornamental Plants by E. D. Carpenter, University of Connecticut, (Plant Science Department)

Salt Tolerance of Trees and Shrubs, University of Vermont brieflet 1212, by N. E. Pellett

Symposium on Pollutants in the Roadside, edited by E. D. Carpenter, University of Connecticut

Also available is a computer based bibliography about the role of salt in the environment, from the Shade Tree Laboratories, University of Wisconsin.

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WT&T PRODUCTS

Aquazine, already registered for control of a broad spectrum of nuisance algae and submerged weeds in ponds, has received EPA approval for use on duckweed, watermeal and coontail. Application rates for the three weeds are 3.4 to 6.8 pounds per acre foot of water, depending upon the degree of infestation.

Duckweed *(Lemna* spp.) may require one to five weeks for control, according to Dr. Jack Norton in Ciba-Geigy's registration and toxicology department. Coontail *(Ceratophyllum* spp.) may take up to 10 weeks to halt. Watermeal *(Wolffia* spp.) is more effectively controlled with a split application, Norton recommends. He urges applying one-half the rate and if control isn't satisfactory in three to four weeks, repeat with the other half. Results may take five to nine weeks.

The slow action of Aquazine is an environmental safeguard, according to Norton, because the dissolved oxygen in a pond is not used up quickly in decay processes. The best time for treatment is early in the season, when target algae and weeds are small in size and numbers.

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Lift-O-Boom, available from Ideal Crane Company, is designed to handle objects up to 3000 pounds on a double line with snatch block or 1500 pounds on a single line. The 11-foot, 4-inch lift telescopes beyond the tailgate, then retracts, while lifting to spot the load in the truck body. Lift-O-Boom's 8000-pound electric winch operates from the truck's 12-volt battery and is located on the superstructure for efficient, direct pull.

Lift-O-Boom is installed by bolting to the chassis frame, and can be easily installed or transferred without alterations to the truck. According to the manufacturer, it is rugged, dependable, never charges overtime, and doesn't drink coffee.

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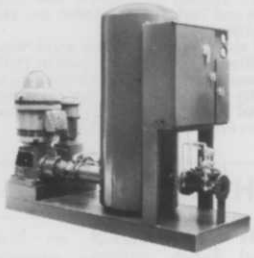

A pumping station with solid state controls to take the guesswork out of time, flow and pressure measurements has been developed by Aqua-Turf. The system features a pumping station of standard design, which is individually customized during manufacture for specific needs of the user. The electronic circuitry provides reliable operation of all control decisions relative to demand requirements. Solid state modules allow easy maintenance and repair.

The pumping stations are manufactured for capacities ranging from 250 to 5000 gallons per minute.

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DCI PLUS is being offered by Lubrication Engineers as a diesel fuel additive to inhibit rust and oxidation in diesel fuel systems. Diesel fuel not inhibited against sludge and oxidation will form sludge and gums which block filters and form choking deposits in the fuel system, according to Lubrication Engineers. Diesel fuel without a pour-point depressant may not move through fuel lines in cold weather. Moisture in fuel may clog filters, burn injector tips and cause fuel line freeze-ups. Rust can accelerate diesel fuel oxidation and shorten the life of expensive storage facilities.

According to Lubrication Engineers, many diesel fuel suppliers add only enough rust inhibitor to protect their own tanks and pipelines and enough oxidation inhibitor to keep the fuel in good condition until it is sold. It is then up to the operator to protect his own storage facilities and insure the best engine performance.

DCI PLUS is concentrated and economical. One gallon fully treats 1000 gallons of diesel fuel in bulk storage. One pint will give full protection for trucks with tanks up to 250 gallons.

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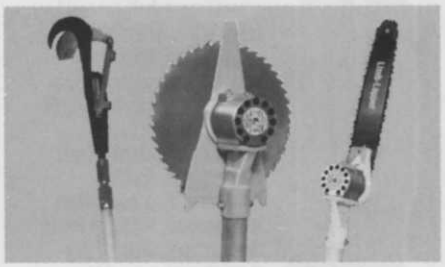
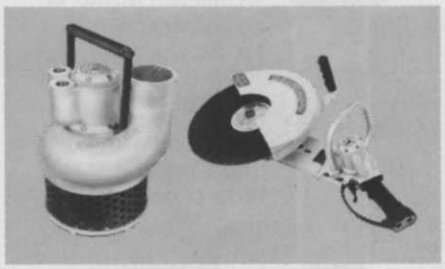


CUT AND PRUNE



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Rates: All classifications 65¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

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BRANCH MANAGER — National automated lawn service presently in franchise market seeks experienced individual to start and head up company areas. Tremendous growth potential for one presently with liquid spray management experience. Send confidential resume to Lawn Doctor, Inc., P.O. Box 525, 142 Highway 34, Matawan, New Jersey 07747.

GROWER NEEDED Growth and in house promotions necessitate filling position of field production manager. Must be well versed in personnel management, equipment coordination. Full knowledge of plants required. Responsible for field planting, quality control herbicide and pest spray programs for general line field grown nursery division. Contact: Robert W. Baker Nursery, Inc., 1700 Mountain Road, West Suffield, Ct. 06093. Phone (203) 668-5633.

LOOKING FOR ADDITIONAL INCOME? Retired superintendents or turf managers wanted as sales agents selling Lesco Products part-time to golf courses and other turf customers in your locality. Opportunities in the southwest, midwest, northeast and western states. Reply with photo and resume to: Robert F. Burkhardt, Vice President, 300 S. Abbe Rd., Elyria, Ohio 44035.

TREE & LANDSCAPE sales executive to manage established commercial and residential sales of large Western New York State firm. Oversee sales staff of 8. Reports directly to president. Top salary plus commission. Submit resume to: Box 199, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

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EVENTS

Midwest Agricultural Chemicals Association Annual Meeting, Chase Park Plaza Hotel, St. Louis, Mo., **Sept. 5-7.** Contact Wayman Lipsey, MACA, P.O. Box 113, West Burlington, Iowa, 52655, phone: 319/752-8441.

National Fertilizer Solutions Association, Mid-Atlantic Conference, Omni International, Norfolk, Va., **Sept. 6-7.** Call: 309/691-2870.

Georgia Turfgrass Field Day, University of Georgia, Athens campus, Athens, Georgia, **Sept. 7.** Contact Tim Bowyer, Extension Agronomy Department, University of Georgia, Athens, Ga., 30602.

Tennessee Nurserymen's Association Convention and Trade Show, Civic Center, McMinnville, Tenn., **Sept. 7-9.** Contact Neil L.Woodiel, phone: 615/473-3951.

Rocky Mountain Regional Turfgrass Field Day, Colorado State University, Fort Collins, Colo., **Sept. 8.** Contact: Dr. Jack Butler, phone: 303/491-7019.

Transworld Home Horticulture Exhibit, Chicago Expocenter, Chicago, Ill., **Sept. 10-13.** Call: 312/446-8434.

Illinois Turfgrass Field Day, Ornamental Horticulture Research Center, Urbana-Champaign, Ill., **Sept. 12.** Contact: Dr. John R. Street, 106D Horticulture Field Lab, University of Illinois, Urbana-Champaign, Illinois, 61801.

National Lawn & Garden Distributors Association Annual Convention, Caesars Palace, Las Vegas, Nevaga, **Sept. 12-15.** Contact: Lawn and Garden Distributors Association, 1900 Arch Street, Philadelphia, Pa., 19103.

Ohio Turf and Landscape Day, Ohio Agricultural Research and Development Center, Wooster, Ohio, **Sept. 12.** Contact: Edward Roche, OARDC, Wooster, Ohio, 44691, phone: 216/264-1021.

Virginia Turfgrass Field Days and Trade Show, Virginia Polytechnic Institute and State University, Blacksburg, Va., **Sept. 12-14.** Contact: Dr. John Shoulders, Department of Agronomy, 419 Smyth Hall, VPI Blacksburg, Va., 24061, phone: 703/951-5797.

International Pesticide Applicators Association Annual Convention, Sea-Tac Motor Inn, 18740 Pacific Highway South, Seattle, Wash., **Sept. 13-15.** Call: 206/362-9100.

Michigan Turfgrass Northern Field Day, Traverse City Country Club, Traverse City, Mich., **Sept. 13.** Contact: Paula M. Dietz, Dept. of Crop and Soil Sciences, Soil Science Building, Michigan State University, East Lansing, Mich., 48824.

Virginia Tech Turfgrass Field Days and Trade Show, Virginia Polytechnic Institute and State University, Blacksburg, Va., **Sept. 13-14.** Contact: John Shulders, Cooperative Extension Service, Va., Polytechnic Institute and State University, Blacksburg, Va., 24061.

International Foliage Plant Seminar, Quality Inn, Anaheim, Calif., **Sept. 17-19.** Contact: The Living Plant Growers Association, P.O. Box 289, Encinitas, Calif., 92024, phone: 714/753-5727.

Pacific Horticultural Trade Show, Anaheim Convention Center, Anaheim, Ca., **Sept. 20-22,** Call: 916/443-7373.

1978 Northwest Turfgrass Conference, Holiday Inn, Richland, Wash., **Sept. 25-28.** Contact: Dr. Roy Goss, Western Washington Research and Extension Center, Puyallup, Wash. 98371.

Entomological Society of America, Eastern Branch, 50th Anniversary Meeting, Americana of New York Hotel, N.Y., N.Y., **Sept. 27-29.** Contact: D.W.S. Sutherland, chm., Public Information Committee, Eastern Branch ESA, 125 Lakeside Drive, Greenbelt, Md., 20770.

Fourth Annual Garden Industry of America Conference and Trade Show, Cincinnati Convention and Exposition Center, **Sept. 29-Oct. 1.** Call: 612/374-5200.

International Garden Trade Fair, Cologne trade fair centre, Cologne, West Germany, **Oct. 1-3.** Contact: Messe- und Ausstellungs-Ges.m.b.H Koln, Postfach 21 07 60, D-5000 Koln 21, phone: (0221)8211.

California Association of Nurserymen's 68th Annual Convention, Ahwahnee Hotel, Yosemite National Park, Calif., **Oct. 3-5.** Contact: C.A.N. office, 1005 8th Street, Suited 302, Sacramento, Calif., 95814, phone: 916/448-2881.

Central Plains Turfgrass Conference, Kansas State University, Manhattan, Kan., **Oct. 4-6.** Call: 913/532-6170.

Northern California Turfgrass Council Irrigation Seminar, Goodman Hall, Jack London Square, Oakland, Calif., **Oct. 4.** Contact: Richard Harrison, Room 201, City Hall, Alameda, Calif. 94501.

Professional Grounds Management Society's 65th Annual Conference and Trade Show, Atkinson Hotel, Indianapolis, Ind., **Oct. 8-12.** Contact: Allan Shulder, Professional Grounds Management Society, 19 Hawthorne Ave., Pikesville, Md., 21208.

Florida Turf-Grass Annual Management Conference and Show, Sheraton Towers Hotel, Orlando, Fla., **Oct. 15-18.** Contact: Florida Turf-Grass Association, 1520 Edgewater Drive, Suite E., Orlando, Fla., 32804, phone: 305/425-1581.

The Irrigation Association Short Course Program, Wastewater Irrigation, Kansas City, Mo., **Oct. 17-19.** Call: 301/871-1200.

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Events *from 44*

18th Annual Southern California Turf/Landscape Equipment & Materials Educational Exposition, Orange County Fairgrounds, Costa Mesa, Cal., **Oct. 18-19.** Call: 213/798-1715.

Southwest Turfgrass Conference, Texas Research Center at El Paso, Texas A&M University, El Paso, Tex., **Oct. 19-20.** Dr. Garald Horst, Texas A&M University, Research Center at El Paso, 1380 A&M Circle, El Paso, Tex., 79927.

Western Garden Writers Symposium and Trade Show, Mansion Inn, Sacramento, Calif., **Oct. 21-23.** Call: 916/448-2881.

Florida Nursery and Allied Trades Show, Curtis Hixon Convention Center, Tampa, Fla., **Oct. 27-29.** Contact: FNATS, Inc., 6535 E. Hillsborough Avenue, Tampa, Fla., 33600, phone: 813/626-4149.

Landscape Industry Cost Accounting Seminar, Empire Room, Newporter Inn, Newport Beach, Calif., **Oct. 28.** Call: 213/941-4900.

National Institute on Park and Grounds Management Eighth Educational Conference, Denver, Colo., **Oct. 29-Nov. 2.** Contact: Erik Madisen, Jr., executive secretary, NIPGM, Executive Offices, National Institute, Box 1936, Appleton, Wisc., 54911, phone: 414/733-2301.

ALCA Design/Build Symposium, Dallas, Tex., **Nov. 8-9.** Call: 703/893-5440.

Eighteenth Annual Missouri Lawn and Turf Conference, Hilton Inn, Columbia, Mo., **Nov. 8-10.** 314/882-7838.

Colorado Annual Pesticide Applicator Workshop, Hilton Inn Airport, Denver, Colo., **Nov. 14-15.** 303/839-2838.

The Irrigation Association Short Course Program, Agricultural Irrigation, Salt Lake City, Utah, **Nov. 14-16.** Call: 301/871-1200.

32nd Annual New York State Turfgrass Conference and Trade Show, The Turf Inn, Albany, N.Y., **Nov. 14-16.** Call: 716/434-5338.

California Landscape Contractors Association Annual Convention, Hyatt Lake Tahoe Hotel, Lake Tahoe, Nev., Nov. 19-21. Contact: Mike Leeson, CLCA, 6252 E. Telegraph Road, Los Angeles, Calif., 90040, phone: 213/728-2522.

New Jersey Turfgrass Expo '78, Cherry Hill Hyatt House, New Brunswick, N.J. **Nov. 28-Dec. 1.** Contact: Dr. Henry Indyk, Cook College, Rutgers University, P.O. Box 231, New Brunswick, N.J., 08903, phone: 201/932-9453.

ALCA Maintenance Symposium, San Jose Hyatt House, San Jose, Calif., **Nov. 29-Dec. 1.** Call: 703/893-5440.

National Fertilizer Solutions Association, 24th Annual Convention and Chemical/Equipment Exhibition, Georgia World Congress Center, Atlanta, Georgia, **Dec. 4-7.** Call: 309/691-2870.

The Irrigation Association Short Course Program, Turf Irrigation, San Francisco, Calif., **Dec. 5-7.** Call: 301/871-1200.

Ohio Turfgrass Conference and Show, Columbus, Ohio, **Dec. 5-7.** Ohio Turfgrass Foundation, 1827 Neil Avenue, Columbus, Ohio, 43210.

Illinois Turfgrass Conference and Show, Ramada Inn Convention Center, Champaign, Ill., **Dec. 12-14.** Contact: Dr. John R. Street, 106D Horticulture Field Lab, University of Illinois, Urbana-Champaign, Illinois, 61801.

Landscape Design Short Courses, Fisher Auditorium, OARDC, Wooster, Ohio, **Dec. 12-14.** Contact: Fred K. Buscher, Area Extension Center, OARDC, Wooster, Ohio, 44691.

17th Nebraska Turfgrass Conference, Nebraska Center, University of Nebraska, Lincoln, Neb., **Jan. 8-10, 1979.** Contact: Dr. R. C. Shearman, Turfgrass Specialist, 105 Plant Industry Bldg., University of Nebraska, Lincoln, Neb., 68583.

48th Annual Winter School for Turf Managers University of Massachusetts, Amherst, Ma., **Jan. 8-Mar. 2, 1979.** Call: 413/545-2353.

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Having genuine Jacobsen parts in stock makes sense.

Having 3,200 different types of parts makes news.

The average Jacobsen distributor carries about 3,200 different kinds of genuine Jacobsen replacement parts in stock at all times.

That's one heck of a lot of parts. But when a piece of equipment goes down, you want it back in action fast. And with genuine parts because they're made to fit and work perfectly. So a big selection is important.

If you do a lot of your own equipment maintenance and repair, this is just one reason to go with Jacobsen. Here's another. Your Jacobsen distributor can even help you set up your own inventory of most likely used parts. Which can speed up repairs even more.

If you don't do much maintenance yourself, it's good to know your Jacobsen distributor has plenty of parts, plus trained mechanics who specialize in servicing Jacobsen equipment.

Either way, you're ahead of the game with Jacobsen. Good equipment to start with. A distributor who stands behind your equipment with a large supply of genuine parts. And the Jacobsen factory squarely behind the distributor. Just so you always get the same fine performance you expect with equipment that has the name Jacobsen on it.

It isn't hard to find a good argument for going with Jacobsen. There are 3,200 of them in the parts department alone.

Take a look at leadership.

Jacobsen Manufacturing Company, Racine, Wisconsin 53403

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"One crew grows our sod, another crew lays it at the customer's home or place of business...Both crews have their own reasons for preferring

baron* Kentucky Bluegrass."

John Hoerr of D. A. Hoerr & Sons, Peoria, Illinois.

D. A. Hoerr and Sons, Peoria, Ill., raises 500 acres of sod and lays much of it through their Landscape Contractual Division at commercial, industrial, municipal and homeowner sites. James Hoerr says: "Since we began using Baron Kentucky Bluegrass, we've had less problems raising a good quality sod and even fewer problems after the sod is laid. We can't just sell sod and hope for the best. We're responsible, even after installation. We find it pays to start with the very best seed we can buy. Baron gives us a well knit sod that takes root quickly, cutting down on service calls".

"When it comes to marketing sod, I can do it faster with Baron. John Hoerr says, "Baron's fast germination and quick development into mature sod shortens the time between planting and the day I sell my sod. In the sod growing business, that means money in our pockets."

"We use a blend of 3 bluegrasses with a minimum of 50% being Baron Kentucky Bluegrass. The other two varieties are Majestic and Merion. The high percentage of Baron insures us of what we consider to be our safety factor."

"Since we have been putting Baron in our mixture, we find the overall color holds up with less fertility. I use less fertilizer with Baron in the mixture than I have with any other bluegrass mixtures."

"All of our sod is mechanically harvested so it's important that root development is rapid and our sod holds together well. Baron lets us keep our fields clipped close and roots seem to knit well, giving us less hauling and handling problems. In our Landscape Contract and Maintenance Contract Servicing Departments, we know in advance complaints from the end user will be minimal."

If you're a sod grower, golf superintendent, or a professional landscape contractor, top quality turf is important to you. Lofts is ready to help with Baron, Majestic or Touchdown Kentucky Bluegrasses, Jamestown Chewings Fescue, Yorktown and Diplomat Ryegrasses as well as other varieties.

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*U.S. Plant Patent #3186, Dwarf Variety

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